Original Research Article

Prevalence of anaemia and visual impairment among primary school children of South Gujarat region of India: a cross sectional study

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ABSTRACT

Background: Nutritional Anemia and visual impairment among school age children are recognized as major public health problem in India. Authors objective was to study prevalence of anemia and visual impairment among school going adolescents of Vadodara and Surat city of Gujarat, India.

Methods: This cross sectional study was carried during period from April 2015 to March 2016. Total 8 schools were selected from Vadodara and Surat city by purposive sampling. After taking the permission of principals of schools and informed written consent of the parents of children, 859 children from these schools were examined for anaemia and visual impairment. The data was collected by predesign, pretested proforma and analysed using SPSS version 17 (Trial version).

Results: Out of total 859 children 421(49.1%) were female. Mean age of the study children was 8.95±1.52 years. The prevalence of anemia in children in present study was 61.6 % (529 children). The prevalence of anemia in female (274, 65.1%) was higher than males (255, 58.2%). Moderate visual impairment and blindness was 5.9% in girls and 8.2% in boys respectively. Severe visual impairment and blindness was 2.1% in girls and 2.7% in boys respectively and the gender difference was not statistically significant. Though 61(7.1%) children had moderate to severe visual impairment to blindness only 21 (2.4%) children were wearing spectacles.

Conclusions: High prevalence of anaemia and visual impairment among these children needs great attention and health education.

Keywords: Anemia, Primary, School health, School children, Visual Impairment

INTRODUCTION

A school is a key location to educate children about health, hygiene and nutrition, and to put in place interventions to promote the health of children. At the same time, poor health, poor nutrition and disability can be barriers to attending school and to learning. Schools provide an environment, for learning skills, and for development of intelligence that can be utilized by students to achieve their goals in life.[1] It is also observed that "to learn effectively, children need good health." Health is key factor in school entry, as well as continued participation and attainment in school.[2]

The school is also potentially a location for contracting infections or diseases. Finally, school setting influence

childhood health behavior habits such as diet and physical activity and often track into adulthood.[2] The common morbidities found in school age children are nutritional deficiencies, dental, visual and hearing problems, respiratory infections, skin conditions, loco motor disabilities and congenital heart and other problems. The fact is that the most of these conditions are preventable or avoidable and curable especially in early stages by promotion of hygienic practices among school children through proper health education by teachers, who are the first contacts.[3]

WHO estimates that around two billion people are anemic with approximately 50% of all anemias attributable to iron deficiency. India is among the countries with highest prevalence of anemia and visual deficiency among school children.[4] With this background in mind this study was planned to throw light on prevalence of Anemia and visual impairments among children of primary school.

METHODS

This cross sectional study was carried during period from April 2015 to March 2016. Total 8 schools were selected from Vadodara and Surat city by purposive sampling. Permission of principals of schools and informed written consent of the parents of children were taken.

Inclusion criteria

Adolescents whose parents gave consent were included in the study.

Exclusion criteria

Students whose parents did not give the consent and those who were absent on the day of examination were excluded from the study.

Total 859 children were the study population. Total 859 children were examined using Pre-designed, pre-tested, semi-structured WHO standard with ICMR modifications questionnaire for nutritional deficiencies. Performa contained general information, anthropometry and general health check-up of the children. The modification included deletion of columns irrelevant to the present study and addition of some columns to record other health abnormalities specially which are common in children.

Completed age in years on the last birth days was calculated from the admission register of the school distant vision were tested by using Snellen's chart having dots of standard sizes keeping it at a distance of 6 meters. Each eye was tested separately by covering the other eye with a cardboard. Colour Blindness was studied by innovative method. From a tuft of woolen threads of basic colours, the child was asked to pick up various threads in the turn to detect colour blindness for these

colours. Nutritional deficiencies were ascertained by noting the deficiency signs clinically without conducting any biochemical tests.

Data was entered in Microsoft Excel and analysis was done using SPSS statistical package. Parameters such as rate, ratio and percentages were calculated. In order to have valid interpretation of rates, 95% confidence intervals (CI) were calculated. To test the significance of the difference among the statistical parameters in different subsets of population, suitable statistical tests were applied. They included chi-square test and Z- test.

RESULTS

Out of total 859 children 421 (49.1%) were female. Mean age of the study children was 8.95±1.52 years. Maximum numbers of the children were in the age group of 5-8 years (60.1%). Mean age of female and male children was 8.81±1.26 years and 8.96±1.12 years respectively. (Table 1)

Table 1: Gender wise distribution of children according their age groups.

Age	Female	Male	Total
5-8	268 (31.2)	249 (29.0)	517(60.1)
9-12	153 (17.8)	189 (22.0)	342 (39.9)
Total	421 (49.1)	438 (50.9)	859 (100)

(Figures given in parentheses are percentages)

The prevalence of anemia in children in present study was 61.6 % (5291 children). The prevalence of anemia in female (274, 65.1%) was higher than males (255, 58.2%). Possible reasons for IDA include poor consumption of DGLV, and less absorption of iron (Table 2).

Table 2: Distribution of children according to signs of iron deficiency.

Signs	Gender		Total 859 (100)
	Female 421 (100)	Male 438 (100)	
Pallor of tongue	271 (64.4)	249 (56.8)	520 (60.5)
Pallor of conjunctiva	269 (63.9)	252 (57.5)	521 (60.7)
Pallor of nail	274 (65.1)	255 (58.2)	529 (61.6)

(Figures given in parentheses are percentages)

Moderate visual impairment and blindness was 5.9% in girls and 8.2% in boys respectively. Severe visual impairment and blindness was 2.1% in girls and 2.7% in boys respectively and the gender difference was not statistically significant. Though 61(7.1%) children had moderate to severe visual impairment to blindness only

21(2.4%) children were wearing spectacles. Blindness was observed in 1 male and 1 female student (Table 3).

Table 3: Gender wise distribution of children according to their vision.

Visual impairment and category	Gender		Total 859 (100)
	Female 421 (100)	Male 438 (100)	
Mild or no visual impairment Category 0	386(91.7)	389(88.8)	775(90.2)
Moderate visual impairment Category 1	25(5.9)	36(8.2)	61(7.1)
Severe visual impairment Category 2	9(2.1)	12(2.7)	21(2.4)
Blindness Category 3	1(0.2)	1(0.2)	2(0.2)

(Figures given in parentheses are percentages)
Chi-square: 2.051 degrees of freedom: 2 p=0.3586

DISCUSSION

Out of total 859 children 421 (49.1%) were female. Mean age of the study children was 8.95±1.52 years. Maximum numbers of the children were in the age group of 5-8 years (60.1%). Mean age of female and male children was 8.81±1.26 years and 8.96±1.12 years respectively. The prevalence of anemia in children in present study was 61.6 % (5291 children). The prevalence of anemia in female (274, 65.1%) was higher than males (255, 58.2%). Moderate visual impairment and blindness was 5.9% in girls and 8.2% in boys respectively. Severe visual impairment and blindness was 2.1% in girls and 2.7% in boys respectively and the gender difference was not statistically significant. Though 61(7.1%) children had moderate to severe visual impairment to blindness only 21(2.4%) children were wearing spectacles. Blindness was observed in 1 male and 1 female student.

In Gunjana G et al, out of total 421 children 205 (48.7%) were female.[1] Mean age of the study children was 7.9±1.06 years. Maximum numbers of the children were in the age group of 5-7 years (60.4%). Mean age of female and male children was 7.8±1.29 years and 7.9±1.32 years respectively. The prevalence of anemia in children in present study was 61.9 % (261 children). The prevalence of anemia in female (134, 62.9%) was higher than males (130, 60.1%). Moderate to severe visual impairment and blindness was 7.2% in girls and 10.5% in boys respectively and the gender difference was not statistically significant. Though 38(8.9%) children had moderate to severe visual impairment to blindness only 10(2.3%) children were wearing spectacles.

In Thakor N et al, age of the study children (total 867) ranged from 5-19 years. Mean age was 13.80 ±1.96 years. Out of 867, 434 (49.9%) were boys and 433 (50.1%) were girls. The study revealed that 46.7% girls were suffering from anemia compare to 37.3% of boys. 122 (12.9%) children had visual impairment.[2]

In Nayak S et al, the mean age of children was 15.8±1.96 years. Out of 841, 432 (51.4%) were boys and 409 (48.6%) were girls. The study revealed that 67.0% girls were suffering from anemia compare to 58.7% of boys. 117 (13.9%) adolescents had visual impairment.[3]

In Srinivasan K et al, 61.4% children were in the age group of 10-14 years, 84.3% children had one or more morbid conditions, prevalence of anemia in children was 79.6 and 4.4% children had defective vision.[5]

In Panda P et al 59.5% are boys and 40.5% are girls, prevalence of anemia in boys was 22.9% and in girls was 30.5%, 5.6% children had refractive errors.[6]

In Soumya Deb et al, prevalence of anemia in boys was 55.34% and in girls was 51.85%.[7] In Osei A et al, 36.7% children were found anemic in primary school age group.[8]

In Chandna S. et al, children had night blindness in 35.9%, prevalence of anemia in children was 34%.[9] In Rema N et al, prevalence of anemia in boys was 44.08% and in girls was 52.21%, prevalence of vitamin A deficiency in boys was 5.65% and in girls was 8.64%.[10]

As per DLHS (2002-2004), prevalence of anemia in adolescent girls is 72.6%. In India 6-7% children aged 10-14 years have problem with their eyesight. [11]

However, study done in two cities of Gujarat limits us to generalize the results. There is definitely a need for well-planned, large-scale studies to get accurate prevalence of anemia and visual impairment in primary school children.

CONCLUSION

High prevalence of anaemia and visual impairment among these children needs great attention and health education.

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